

Patent Claims

1. A tube piece with at least one bend zone (1.1) and  
5 two outlet zones (1.2, 1.3) adjoining the latter on  
both sides with in each case an end side (1.2', 1.3')  
for the application of pushing rams (2, 3) of an  
internal high-pressure tool which comprises a die (4)  
with a recess (4.5) forming the production cross  
10 section, characterized in that the bend zone (1.1) has  
a different cross-sectional shape from the outlet zones  
(1.2, 1.3) with an approximately identical flow cross  
section (1.4).

15 2. An internal high-pressure tool for manufacturing a  
tube piece (1) as claimed in claim 1, which comprises a  
die (4) with a recess (4.5) forming the production  
cross section (4.4) of the tube bend (1), the recess  
(4.5) having at least one bend zone (4.1) and two  
20 outlet zones (4.2, 4.3) adjoining the latter on both  
sides, characterized in that the recess (4.5) of the  
die (4) has a different cross-sectional shape from the  
outlet zones (4.2, 4.3) with an identical cross-  
sectional area (4.4) forming the production cross  
25 section.

3. The tube piece as claimed in claim 1,  
characterized in that an axis of symmetry (1.6) of the  
bend zone (1.1) extends in a bending plane and, in the  
30 region of the bending plane, the degree of expansion,  
as the ratio of the diameter of the component in the  
bending plane to the diameter of the blank in the  
bending plane, is between 1 and 1.1.

35 4. The tube piece as claimed in one of the preceding  
claims, characterized in that the degree of expansion

in the region normal to the bending plane is between 1 and 2, in particular between 1.3 and 1.5.

5. The tube piece as claimed in one of the preceding  
5 claims, characterized in that a number of bend zones (1.1, 4.1) and a number of bending planes are provided.

6. The tube piece as claimed in one of the preceding  
10 claims, characterized in that the transition of the cross-sectional shape from each outlet zone (1.2, 1.3, 4.2, 4.3) to the bend zone (1.1, 4.1) extends continuously.

7. The tube piece as claimed in one of the preceding  
15 claims, characterized in that the cross-sectional shape of the bend zone (1.1) and/or of the outlet zones (1.2, 1.3) is of round, oval, rectangular or polygonal design.

20 8. A method for manufacturing a tube piece (1) as claimed in one of the preceding claims, characterized in that

a) a tube piece blank (1) with a diameter A is placed  
25 into the recess (4.5) of the die (4) of the internal high-pressure tool and is acted on by the pushing rams (2, 3);

b) the tube piece blank (1) is formed to a desired  
diameter B in the region of the outlet zones (1.2, 1.3);

30 c) the tube piece blank (1) is formed to a desired diameter C in the direction parallel to the bending plane in the region of the bend zone (1.1);

d) the tube piece blank (1) is formed to a desired  
35 diameter D in the direction at right angles to the bending plane in the region of the bend zone (1.1), and

e) the degree of expansion as the ratio of C to A is set between 1 and 1.1.

5 9. The method as claimed in one of the preceding claims, characterized in that the degree of expansion as the ratio of D to A is set between 1 and 2, in particular between 1.3 and 1.5.